

Zadatak 54. Odredi skup točaka određen jednažbom:

- 1) $x^2 + 4y^2 + 2x - 3 = 0$;
- 2) $4x^2 + 9y^2 - 8x + 36y + 4 = 0$;
- 3) $x^2 + 2y^2 - 4y + 10 = 0$;
- 4) $x^2 + 2y^2 - 8x - 4y + 18 = 0$.

Rješenje.

1)

$$\begin{aligned} x^2 + 4y^2 + 2x - 3 &= 0 \\ (x + 1)^2 - 1 + 4y^2 - 3 &= 0 \\ (x + 1)^2 + 4y^2 &= 4 \quad / : 4 \end{aligned}$$

$$E \quad \dots \quad \frac{(x + 1)^2}{4} + y^2 = 1$$

Elipsa s centrom $C(-1, 0)$, $a = 2$, $b = 1$.

2)

$$\begin{aligned} 4x^2 + 9y^2 - 8x + 36y + 4 &= 0 \\ 4(x - 1)^2 - 4 + 9(y + 2)^2 - 36 + 4 &= 0 \\ 4(x - 1)^2 + 9(y + 2)^2 &= 36 \quad / : 36 \end{aligned}$$

$$E \quad \dots \quad \frac{(x - 1)^2}{9} + \frac{(y + 2)^2}{4} = 1$$

Elipsa s centrom $C(1, -2)$, $a = 3$, $b = 2$.

3)

$$\begin{aligned} x^2 + 2y^2 - 4y + 10 &= 0 \\ x^2 + 2(y - 1)^2 - 2 + 10 &= 0 \\ x^2 + 2(y - 1)^2 &= -8 \implies \text{prazan skup} \end{aligned}$$

4)

$$\begin{aligned} x^2 + 2y^2 - 8x - 4y + 18 &= 0 \\ (x - 4)^2 - 16 + 2(y - 1)^2 - 2 + 18 &= 0 \\ (x - 4)^2 + 2(y - 1)^2 &= 0 \end{aligned}$$

Jedna točka $T(4, 1)$.